EPA/CDH REQUIREMENTS FOR APPROVAL & COMMENTS ON PROPOSED INTERIM MEASURE/INTERIM REMEDIAL ACTION PLAN FOR 881 HILLSIDE HIGH PRIORITY SITES

Table of Contents. Section 4.5. is titled; Detailed Evaluation of Removal Action Alternatives. This Interim Measure/Interim Remedial Action (IM/IRA) is not a removal action and all references to removal actions must be changed to reflect this.

Section 1.1. The Interim Remedial Action (IRA) is considered a time critical action due to the presence of the two identified ground-water plumes and their proximity and potential affect on the water quality of Woman Creek. This must be reflected within the document.

The clean-up action at the 881 Hillside is a requirement under HSWA corrective action as well as CERCLA. Language within the document shall reflect both authorities.

Final RCRA Facility Investigation/Remedial Investigation (RFI/RI) and Corrective Measures Study/Feasibility Study (CMS/FS) Reports shall be prepared to address remediation needed for all contaminated soils, bedrock groundwater and alluvial groundwater associated with the 881 Hillside, regardless of the construction of the IM/IRA. The Final RFI/RI for the 881 Hillside cannot be limited to addressing only the media not addressed through the IM/IRA, but must evaluate the problems associated with the entire Operable Unit (OU), and the results of the Background Study in progress. The final CMS/FS for the 881 Hillside must then evaluate appropriate alternatives for Corrective/Remedial Action, taking into consideration the proven effectiveness of the IM/IRA, only. If the effectiveness of the IM/IRA has not been proven by the time the final CMS/FS is complete, the CMS/FS must be prepared as if the IM/IRA had not been approved.

Section 2.1.5.1. Clarification of whether this IM/IRA will impact any wetlands associated with the 881 Hillside shall be presented within the Plan.

Section 2.1.6.1. The 881 IRA is not a removal action.

If the arithmetic means presented in tables 2-1, 2-2 and 2-3 incorporate rejected or invalidated data, this must be stated within the report.

The purpose of grouping the alluvial groundwater into three groups is not clear. The grouping of the alluvial groundwater and subsequent averaging of the alluvial

groundwater wells within each group for the purpose of comparison to ARAR standards is inappropriate.

DOE's response to the comments on the March 1, 1988, 881 Hillside RI/FS (Response to Appendix 2, Comment 4) indicated that RCRA groundwater protection standards are not directly applicable to the Hillside but are relevant and appropriate. EPA agrees with this interpretation. As presented in Tables 2-1, 2-2, and 2-3, DOE is now considering the RCRA groundwater performance standards as "to be considered" (TBC). This is not correct. Therefore, when applicable or relevant and appropriate MCL standards are not available, the groundwater data for the Hillside must be compared to background for determination of whether ARARs have been exceeded.

The IM/IRA plan must state that the background range for the alluvial groundwater is based on well 55-86 only, and that the background range for alluvial soils and groundwater may change after completion of the Background Study and evaluation of the data collected as a result. The plan must acknowledge that the final RFI/RI and resultant CMS/FS for the 881 Hillside will reflect the results of the Background Study and that this information may impact the Corrective/Remedial Action ultimately selected and the effectiveness of this IM/IRA.

Section 2.1.6.2. It should be noted that EPA does not regard all units within the 881 Hillside OU as being adequately characterized. Thus, it is more appropriate to state that with the information we presently have, organic contamination of soils does not appear to present unacceptable risk to public health, and that further evaluation will be conducted pursuant to the Phase III 881 RFI/RI.

Section 2.1.6.3. As stated by EPA in the comments on the March 1, 1988, 881 Hillside RI/FS (Section 6, Comment 7 and Section 6, Comment 8), the VOCs detected in SW-41, SW-32 and the sediments cannot be dismissed without further information. Attachment G to DOEs response to comments on the March 1, 1988, 881 RI/FS does not refute the presence of volatiles in the sediments of Woman Creek. The report must state that further information will be gathered to evaluate the presence or non-presence of volatiles within the sediments and surface waters affected by Woman Creek.

Section 3.2. The schedule provided indicates start up of the system in April 1991. This date is not consistent with the objective of the IRA which is to prevent further release of contaminants as timely as possible. DOE shall accelerate the schedule, to the extent possible, to meet a more timely

action. As discussed during a September 22, 1989 meeting, DOE shall adjust the schedules to reflect goals for starting construction by November 1, 1989 and start up of equipment by January 1, 1991.

Table 3-2 The arithmetic mean of parameters for Hillside wells is not representative of the actual condition of each SMWU. In determining if a parameter has exceeded an ARAR, DOE shall evaluate each parameter as it occurs at each SWMU.

The action plan must not state that the Environmental Assessment will result in a FONSI prior to the determination.

The completion of Engineering Design for the Groundwater Collection system is stated as June 1990. This must be accelerated as design and construction of the collection system is the critical element in completing the IM/IRA.

Section 3.3.1. Table 3-1 does not contain all the pertinent chemical specific ARARs. The table must include chromium at 0.05 mg/l, 1,2 DCA at 5 ppb, nitrate at 10 mg/l, and gross beta at 4 mrem/yr.

Table 3-2 presents RCRA Subpart F standard as TBC. The RCRA Subpart F standard (i.e. background) must be considered relevant and appropriate. These standards must be presented for all relevant RCRA Appendix VIII constituents, i.e. the table must also include chromium, and nickel. Table 3-2 indicates that tritium and cesium 137 were not measured at the 881 Hillside. This is not correct.

The group averages of 881 alluvial wells must not be used to compare to ARAR standards. Average groundwater concentrations cannot be used when comparing conditions within or resultant to a site, with ARARs. The comparison of groundwater concentrations to ARARs does not have any relationship to determination of expected concentrations of the constituent in the influent to the treatment facility. Comparison of ARARs to effluent of the treatment facility is necessary in order to evaluate the effectiveness of each alternative considered within the CMS/FS. The chemical specific ARARs analysis must be conducted for calcium, cesium, cobalt, magnesium, potassium, and sodium. Background should be considered for these above constituents, as is presently known, (in mg/l) at 33.8, .02, .022, 5.9, .8, and 13.1, respectively. Given the present knowledge of background for metals, inorganics and radionuclides, ARARs are exceeded for chromium, copper, manganese, mercury, nickel, selenium, TDS, chloride, nitrate, sulfate, gross alpha, and gross beta. ARARs are probably exceeded for total uranium (Need to convert pCi/l

to mrem/yr). The TBC background values for the RCRA non-Appendix VIII constituents calcium, lithium, magnesium, potassium, sodium, strontium, zinc, and bicarbonate are also exceeded.

Section 3.3.1.4. DOE shall recognize, and include in the action plan, that the Colorado Hazardous Regulations 6-CCR-1007-3 Part 264 are also applicable. The site is considered a HSWA site in which case RCRA concentration limits are relevant and appropriate.

RCRA Subpart F groundwater protection standards are relevant and appropriate. DOE has agreed to this via the response to EPA comments on the March 1, 1988, 881 Hillside RI/FS, (Response to Appendix 2, Comment 4). The document must be altered to reflect this.

Section 3.3.3. DOE shall recognize, and include in the action plan, that the Colorado Hazardous Waste Regulations 6-CCR-1007-3 are also applicable.

Section 4.1. The IM/IRA requires treatment of organics, inorganics, and radionuclides. Treatment for these three sets of parameters shall continue until it is demonstrated that the clean-up level has been met.

Section 4.3. The design basis for the 881 Hillside treatment facility must address those constituents which are above ARAR, including gross alpha, and gross beta. As stated above in comments on Section 3.3.1., ARARs evaluation do not have any bearing on influent concentration to the treatment facility. Effluent from the facility must be compared to ARARs.

Section 4.3.2.2. The effectiveness of the UV/Peroxide oxidation may be effected by the presence of ferrous iron. The plan must consider this prior to acceptance of this system. If ferric iron precipitation is a problem, introduction of air into the collected trench leachate prior to entering the equalization tanks and filter beds may eliminate this problem. Injection of acid upstream of the UV/Peroxide system may also inhibit ferric iron precipitation. DOE must be prepared to provide the necessary unit processes upstream of the UV/Peroxide system in the event iron precipitation or scaling decreases the UV/Peroxide system performance. The plan should also discuss the effectiveness of the UV/Peroxide system in light of bench scale testing which has taken place. The bench scale tests should have utilized a mixture of the three sources of alluvial groundwater which are to be intercepted in proportions anticipated, so as to preclude the possibility of developing a system for a geochemistry not present after mixture.

DOE must document confirmation from Plant Waste Operations that the Building 374 waste water treatment system can treat the additional 14,000 gallons per week of ion exchange regenerate wastes prior to acceptance of this alternative.

DOE shall provide EPA and CDH with accurate, detailed piping and instrumentation diagrams which include all unit processes, flow regulating and metering devices and sample points. DOE shall provide EPA and CDH with "as-built" drawings incorporating all field changes and accurately reflecting the constructed trench and treatment systems installed.

DOE shall provide extensive training for both operators and maintenance personnel responsible for the treatment system. The training shall be documented. DOE shall provide EPA and CDH a complete operation and maintenance manual for the treatment system.

Section 4.3.5.4. The Table 4-6 operation and maintenance manhours estimate, and resultant cost estimate differs from that presented within the text. This difference must be corrected and the final present worth calculation reevaluated.

Section 4.5.1.1. The drain must be located downgradient of wells 2-87 and 48-87. This is not clearly represented in the text of the plan or on Figure 4-8. These wells are impacted by the units within the 881 Hillside and contain inorganic constituent levels significantly higher than ARAR. The drain should be extended approximately 300' to capture any groundwater released from the 119.2 unit, if groundwater is present as determined by the borings to be place around 119.2 (as stated in Section 6.0.). Dry wells do not prove that groundwater is not leaving the unit, and perched groundwater does move through the unit as a result of precipitation events. This requirement was stated in the September 6, 1989, letter to DOE.

The synthetic membrane must line the bottom and both sides (upgradient and downgradient) of the trench to form a sump. The top of the sump shall be located approximately two feet below the interface of the 10^{-6} cm/s hydraulic conductivity bedrock and, bedrock or alluvial soils having greater than 10^{-6} cm/sec hydraulic conductivity.

The 6" perforated PVC pipe shall be located within this lined sump with top of pipe below the top of the sump. The concrete collection sumps shall also be lined with synthetic membrane.

It is unclear what the effect and purpose of the large diameter pumping well within 119.1 will do to alleviate problems within this site. The design cone of depression and the effect on the hydrology and contaminants within 119.1 must be evaluated. The design must evaluate the effect of a large bore well as opposed to numerous small bore wells in relation to the purpose of the well within 119.2 and it's relationship to the final remedy.

The french drain must be keyed at least 2 feet into bedrock having a hydraulic conductivity less than or equal to 10^{-6} cm/s. Sandstone lenses occur within the Arapahoe Formation and may act as a preferred pathway for ground water. The french drain must be keyed at least 2 feet into low permeability Arapahoe formation claystone or siltstone ($K \leq 10^{-6}$) and not the sandstone lenses. The presence of sandstone units and the consequent necessary deepening of the excavation will also potentially require additional sump pumps to collect in-flow at the lower trench areas.

The east and west ends of the french drain shall be keyed into low permeability ($K \leq 10^{-6}$) bedrock in order to prevent potential flow around the french drain.

Section 4.5.1.2. The trench design must be changed to provide for penetration two feet below the interface of 10^{-6} cm/s hydraulic conductivity bedrock and bedrock having a hydraulic conductivity greater than 10^{-6} cm/s.

Section 4.5.1.3. The thirty year projected useful life of the french drain is irrelevant. The results of the final RFI/RI, CMS/FS for the 881 Hillside will result in selection of a corrective/remedial action which will require the long-term operation and maintenance of the remedy and will require review of the remedy every five years to assure that public health and the environment are being protected by the remedial action being implemented.

The fabric filter must be sized to preclude the possibility of clogging of the fabric pores. The number of downgradient wells to be used to monitor downgradient alluvial and bedrock groundwater conditions and to evaluate the effectiveness of the french drain must be reconsidered dependent on the saturated zones discovered through construction of the trench (Section 6.0 states that 5 wells will be placed along the trench and downgradient), and in light of the fact that leachate detection is not being considered for the trench. As plumes released from the sites at the 881 Hillside have never been adequately delineated, the construction of the IM/IRA must be used by DOE to gain further insight into the migration of groundwater within the alluvium/colluvium at the Hillside.

All saturated alluvial zones transected along the hillside must be monitored, upgradient and downgradient of the trench. Downgradient wells must also monitor the bedrock so as to verify that contaminated groundwater is not bypassing the drain.

If excavated soils, resulting from a CERCLA response action or RCRA Subtitle C corrective action, are contaminated by land disposal restricted wastes at levels above Best Demonstrated Available Technology (BDAT) treatment standards, the soils must be placed in tanks or containers, or can be placed in compliant interim status or permitted landfills, or surface impoundments, meeting minimum technical requirements, until November 8, 1990. If such excavated soils are contaminated by land disposal restricted wastes at levels below BDAT standards, the soils can be land disposed in permitted or interim status surface impoundments, landfills or waste piles meeting minimum technical requirements.

After November 8, 1990, if excavated soils are contaminated by land disposal restricted wastes above BDAT levels, the soils must be placed in containers or tanks during excavation. Land disposal restricted excavated soils can only be stored in tanks or containers for one year. After November 8, 1990, the soils cannot be land disposed and/or placed in waste piles if the soils exceed land disposal restriction treatment standards (see 40 CFR 268.41).

40 CFR 268.30 (c) allows the land disposal of F001-F005 solvent contaminated soil, resulting from a CERCLA response action or RCRA Subtitle C corrective action, in compliant interim status or permitted landfills or surface impoundments only. Therefore, land disposal restricted soils cannot be land disposed as backfill. The provision for allowance of disposal (i.e. backfilling of contaminated soils) of hazardous wastes is not just limited to a determination of whether the soils are below established risk levels, it is directly dependent on specific soil contaminants and contamination levels as they relate to the land disposal restrictions.

The statement within this section that construction of the drain can be completed in two months, must be coordinated with the schedules presented in Section 3.2.

Pumping records shall be monitored at least weekly in order to ensure that the pumping system is operating. In addition, DOE should consider installation of high level alarms within the sumps to alert operators that the pumps are not operating. Visual inspection of the french drain system shall be performed at least weekly in order to ensure

that the drain has not clogged and that the system is fully operating. Any necessary repairs will be undertaken immediately.

Five piezometer are proposed for installation "along the trench and downgradient" in order to monitor the effectiveness of the french drain system. All relatively high permeability ($K>10^{-6}$) sandstone lenses which are located during trench excavation shall be monitored upgradient and downgradient of the trench. These higher permeability lenses are the zones most likely to show possible circumvention of the french drain system by contaminated ground water.

The encountering of contaminated soils during french drain excavation will result in a necessary realignment of the french drain. The soil borings to be constructed prior to location of the trench must be screened by gas chromatography to determine the presence of land disposal restricted volatile organics. If the screening process identifies organics, the soil shall be evaluated in the laboratory for the presence of all organics, metals and radionuclides. This screening procedure shall be described within the IM/IRA plan. The french drain system is theoretically located along a reach which has not experienced either soil or ground-water contamination. The presence of contaminated soil may very well indicate the existence of contaminated ground water along the extent of the french drain, or even downgradient, compromising the ability of the system to effectively capture all alluvial ground water.

Section 4.5.2.1. The action plan should specify how deep the proposed soil-bentonite slurry walls will be keyed into the underlying claystone bedrock. Provisions must be taken for the presence of localized sand bodies during the excavation, and slurry wall excavation must proceed through any sandstone units and into the Arapahoe formation claystone.

The sump pumps, cap, and perimeter ditches shall be inspected on at least a semi-annual basis to prevent problems from developing. Repairs will be performed immediately after any problems are discovered.

Section 4.5.2.2. The release of known ground-water contamination to the environment from the downgradient areas of SWMUs 119.1 and 107 is unacceptable. Source isolation may minimize future public exposure to contaminants off-site, but the potential still exists for "normal" public exposure due to the impact of the contaminated ground water on the valley fill alluvium. Extraction wells or another system

which is approved by the regulatory agencies will be required if this alternative is selected.

Section 4.5.2.3. The lessened effectiveness of the encapsulation system can be minimized by keying all slurry wall excavation into claystone. Trenches must be excavated and keyed into the claystone below any sandstone lenses which may be present in the vicinity of the SWMUs.

Section 4.5.3.3. Page 4-67, paragraph 1 refers to "construction of the french drain." Alternative 3, the subject of this section, does not contain a french drain in its design. The correct reference here is to the construction of the new de-watering well and not to the french drain of alternative 1.

Section 4.6. Table 4-10 contains an error in the capitol cost figure for alternative 2. According to Table 4-8, page 4-68, the total capital cost should be $481,500 not the $482,500 given in Table 4-10. Thus, the present worth value for alternative 2 becomes $506,500 and not the stated value of $507,500.

Section 5.2. Alternative 2 may not prevent all future contaminant releases, dependent on the life and reliability of the containment system. The plan must state this.

Alternative 1 should result in an effective reduction in the volume of contaminant releases to the alluvial ground-water downgradient of the 881 Hillside area. However, to state that the french drain system will halt <u>all</u> contaminant releases is presumptuous and most likely false, particularly if there are large areas of sandstone lenses along the reach of the french drain. The action plan should be change to reflect this.

Alternative 2 will contain contaminants in place but will not necessarily prevent <u>all</u> future contaminant releases from SWMUs 107 and 119.1. The presence of large sandstone areas along the path of slurry wall construction will most likely impact a noticeable effect on the ability of the system to contain contaminant releases.

Section 6.0. RCRA secondary containment standards for tanks and ancillary equipment shall be considered relevant and appropriate. Buried transfer pipes must be monitored to prevent spillage through breakage of the pipes. DOE must consider whether the burial of pipes will be affected by the land disposal restrictions in the same way as for the trench backfill material.

DOE shall make reference, in the Plan, to subsequent reports which shall be submitted to EPA and CDH while developing and

implementing the IM/IRA Plan (i.e. site health and safety plans, specific design plans, community relations plans,etc.)

The frequency of the effluent monitoring must be approved by EPA and CDH.

As stated, the 22 (or 25) boreholes to be drilled along the 2,100 (or 2,400) feet of the french drain must be drilled deep enough to intercept sandstone lenses which may have been missed after completing the previous (next western most) borehole. However, this must be accomplished by estimating dip at between 7 and 15 degrees as presented in the March 1, 1988, 881 Hillside RI/FS, Section 3.6.3.. Thus, 15 foot penetration into the bedrock must be reconsidered.

As previously stated, DOE must screen the borehole cores for organics, by using a field (real-time) gas chromatograph (GC), in order to prevent the possibility of encountering land disposal restricted wastes within the soils. If preliminary screening for organics proves positive, then the borehole core must be quantitatively evaluated for organics by GC/MS and sampled and analyzed for all HSL metals, inorganics and radionuclides previously encountered at the Hillside. The placement of the trench must consider the results of these investigations.

Among the requirements for a "qualified" geotechnical engineer is registration in the State of Colorado. Any aspect of inspection and certification for the selected alternative shall be performed by a Colorado-registered engineer.

The frequency of effluent monitoring at the treatment plant will be provided in a schedule approved by the regulatory agencies. Effluent monitoring at the treatment plant on a "technically-based level" is not acceptable. Any modifications to the approved effluent monitoring schedule will be decided on by the regulatory agencies after treatment effectiveness has been demonstrated.

DOE must include a reference to an evaluation of potential air emissions from operation of the treatment system, construction activities and excavation activities in the Plan. Such evaluation must determine whether air pollution emission notices and/or permits are required for any activities associated with the IM/IRA.